Description

Double burner for gas cookers, of the type provided with multiple concentric flame crowns.

The present patent application refers to a double burner for gas cookers, of the type provided with multiple concentric flame crowns.

The expression "double burner" is used to indicate a burner with two different gas inlets provided with taps that supply gas to two or more concentric flame crowns separately. The flame crowns can be turned on or off selectively, since gas is supplied by means of two separate independent channels ending into the aforementioned inlets.

In spite of being provided with multiple concentric flame crowns, traditional burners are characterized by the presence of one gas inlet with tap, which feeds all channels used to bring the air-gas mixture to the burner head.

In view of the above, concentric flame crowns of traditional burners operate simultaneously, meaning they are turned on or off together. On the contrary, with double crowns the user can decide whether to turn all flame crowns on or keep some of the crowns off.

The purpose of the present invention is to devise a double burner for gas cookers capable of being converted with simple, inexpensive modifications into a standard burner, that is to say a burner with one tap mounted near one of the inlets, without losing the possibility of supplying gas to all flame crowns of the double burner.

In order to modify the existing models of double burners, a connection pipe must be applied outside the body of the burner to provide communication between the mouths of the two gas inlets, so that the gas introduced in one inlet can flow freely through the connection pipe towards the other inlet that, consequently, does not require to be connected to the gas supply and equipped

with a tap.

The purpose of the present invention is to devise a double burner for gas cookers that can be converted into a standard burner without the introduction of external elements, such as the connection pipe situated outside the body of the burner, by simply removing the internal wall of the body that separates the two gas inlets.

An additional purpose of the present invention is to devise a double burner for gas cookers that can be converted as illustrated above, characterised by versatility of use thanks to the replacement of some elements according to different market requirements.

It is worth mentioning that pots with flat bottom are normally used in Western countries for cooking, while the use of pots with spherical bottom is popular in Asian countries.

In the latter case, to ensure good thermal performance of burners, the flames should be tilted upwards, while in the first case the flames should have a perfectly horizontal direction.

In view of the considerations above, the double burner of the invention has been designed in such a way as to be equipped with two types of interchangeable caps, with the first cap being suitable for emission of flames in horizontal direction and the second cap being suitable for emission in vertical direction.

A further purpose of the present invention is to devise a double burner for gas cookers characterised by the aforementioned modification and versatility of use and provided with compact volume.

The burner of the invention traditionally comprises a tub-shaped body that contains partition walls used to define two different, not-communicating channels, of which one channel is used to supply gas to the external flame crowns and one channel is used to supply gas to the central flame crowns.

The bottom of the body traditionally features two different, not-

communicating gas inlets with horizontal axes used to supply gas to the aforementioned channels selectively.

According to the burner of the invention, the two gas inlets are characterised by the fact that they both reach the centre of the body at a slightly different height. Because of the above, communication between the inlets can be provided, if necessary, by simply drilling a hole with vertical axis from the upper inlet to the lower inlet.

According to the preferred embodiment of the present invention, the axes of the two inlets lay on orthogonal vertical planes.

A vertical channel branches off from the upper inlet provided with the first gas nozzle designed to introduce gas into the supply channel of central flame crowns, while a diverging pair of ascending channels branches off from the lower inlet provided with nozzles designed to introduce gas into the supply channel of external flame crowns.

A Venturi chamber is provided downstream each gas nozzle to favour mixing of gas with primary air.

The burner of the invention has three Venturi chambers, one central chamber with vertical axis above the first nozzle and two chambers in opposite position with inclined axis, respectively above the other two aforementioned nozzles.

The chambers are situated inside the head of the burner, that is to say the circular dish characterised by the presence of a concentric series of multiple toothed crowns, where caps rest to close the cavities of the toothed crowns, it being known that flames come out from each cavity.

Another characteristic of the burner of the invention consists in the fact that it comprises a head formed by a lower dish and an upper dish that perfectly match together to define the opposite pair of Venturi chambers with inclined axis.

The third Venturi chamber is situated in central position in the upper dish,

which is provided with the concentric series of multiple toothed crowns.

For major clarity the description of the double burner of the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration only and not in a limiting sense, whereby::

- Fig. 1 is a cross-section of the burner of the invention with a vertical diametral plane passing through the axis of the first gas inlets;
- Fig. 2 is a cross-section of the burner of the invention with a vertical diametral plane passing through the second gas inlet, which in this case is at a higher height than the first inlet;
- Fig. 3 is the same cross-section as Fig. 1, except for the fact that it refers to the converted version of the burner, as shown by the communication created between the two gas inlets by means of a hole with vertical axis;
- Fig. 4 is the same cross-section as Fig. 2, except for the fact that it refers to the converted version of the burner, as shown by the communication created between the two gas inlets by means of a hole with vertical axis;
- Fig. 5 is a top view of the body of the burner of the invention;
- Fig. 6 is a top view of the head of the burner without caps;
- Fig. 7 is an axonometric view of the burner of the invention, sectioned with two orthogonal vertical planes passing through the axes of the two gas inlets, respectively;
- Fig. 8 is the same cross-section as Fig. 1, except for the fact that it refers to the version of burner with caps to favour the creation of flames with vertical inclination.

With reference to Figs. 1 and 2, the double burner of the invention traditionally comprises a circular body (1) that contains partition walls used to define two different, not-communication channels, of which channel (E) is used to supply gas to the crowns of external flames (FE) and channel (C) to supply gas to central flames (FC).

The bottom of the body (1) traditionally features two different, not-

communicating gas inlets (3 and 4) used to supply gas to channels (C and E), selectively and respectively.

The two gas inlets (3 and 4) reach the centre of the body (1) at a slightly different height; more precisely, the upper inlet (3) exactly ends in the centre of the body (1) and the lower inlet (4) goes beyond the centre.

A vertical channel (3a) branches off from the upper inlet (3) provided with the first gas nozzle (5), that is to say the nozzle used to supply gas into the central channel (C) that feeds the central flame crowns (FC), while a diverging pair of ascending channels (4a) branches off from the lower inlet (4) provided with gas nozzles (6) used to supply gas into the channel (E) that feeds the crowns of external flames (FE).

A Venturi chamber (5a) with vertical axis is provided downstream the nozzle (5), and a pair of Venturi chambers (6a) with inclined axis, preferably from 40 to 60°, is provided downstream the pair of nozzles (6).

Moreover, the burner of the invention comprises a head (T) formed by a lower dish (7) and an upper dish (8) that match perfectly.

More precisely, the lower dish (7) has a truncated conical shape and a stepped external border (7a) that acts as support and centring for the upper dish (8) provided with a stepped perimeter collar (8a).

The upper dish (8) finds a second centring and support in the flat flange (9a) located at the upper end of the partition walls (9) that project from the centre of the body (1) and separate the channels (C and E).

The nozzle (5) is situated in central position inside the partition walls (9), while the nozzles (6) are situated in external opposite position with respect to the walls (9).

The two dishes (7 and 8) are provided with semi-conduits (7b and 8b) that form the aforementioned Venturi chambers (6a). A V-shaped deflector wall (10) is situated downstream the chambers (6a) on the lower dish (7) to favour the bifurcation of the air-gas flow coming from the chambers (6a), which is conveyed

inside a semi-circular corridor (11) and feeds the concentric crowns of central flames (FC), as shown in Fig. 6, in which the three toothed crowns (12) situated above the upper dish (8) are clearly visible.

The corridor (11) is closed by an annular cap (13), on whose external border the concentric crowns of external flames (FE) are formed.

The Venturi chamber (5) is situated inside the upper dish (8) and ends a circular space laterally closed by the toothed crown (12) with lower diameter and by a circular cap (14), on whose external border the concentric crown of central flames (FC) is formed.

As shown in Fig. 3, the double burner of the invention can be converted into an ordinary burner with three concentric flame crowns by drilling a hole with vertical axis (15) on the body in central position from the lower gas inlet (4) to the coaxial vertical channel (3a) with the nozzle (5).

The simple connection of the lower inlet (4) to the gas supply allows to feed the three nozzles – that is to say the central (5) and the lateral (6) nozzles - simultaneously, it being evident that in this case the upper gas inlet (3) must be closed to prevent the gas introduced in the lower inlet (4) from exiting the body of the burner by travelling backwards in the upper inlet (3) .

In order to avoid using external elements, such a closing cap for the inlet (3), the length of the inlet (3) can be suitably reduced, as shown in Fig. 4 .

Since the body (1) is obtained from die-casting, the reduction in length can be easily and economically obtained by simply moving backwards the pin that is used as "core" for the upper inlet (3).

As shown in Fig. 8, to give a vertically inclined direction to the flames, the upper dish (8) and the caps (13 and 14) must be replaced with another dish (80) and two caps (130 and 140) with suitable shape, without having to modify the configuration of the body (1) and the lower dish (7).

Finally, it must be noted that the presence of two Venturi chambers (6a) with inclined, rather than vertical, axis allows to reduce the height of the burner.